REMARKS

Claims 1-22 are presented for examination. Claims 1, 10, and14 have been amended. Basis for the amendments may be found in the specification at, for example, paragraphs [0035] through [0044] (working Examples 1-5) wherein the claimed coatings are used to build devices based on CIGS deposition technology, and in paragraphs [0004] - [0005] where it is stated that CIGS processes require materials to be able to withstand temperatures of 550°C with a resident time of at least an hour. No new matter has been entered.

In the most recent Office Action, the Examiner rejected claims 1-8, 10-17, and 19-22 under 35 USC §103 as unpatentable over Nozue et al (US 4626556), Yagihashi (US 6340735), Aiba et al (US 5183846), Linde et al (US 5043789) and Li et al (US 2003/0171476) "for the reasons stated in the previous Office Action." Nozue, Yagihashi, and Aiba describe silsesquioxane *ladder* polymers that can be coated onto a conductive substrate. Linde was said to disclose a planarizing silsesquioxane copolymer, and Li was said to describe a silsesquioxane polymer containing colloidal silica. In the prior Office Action, the Examiner concluded that it would have been obvious to "utilize [the] disclosure[s] of Yagihashi, Aiba et al, Linde et al, and Li et al in the invention of Nozue et al to optimize [the] coating composition for desired adhesion, strength and dielectric constant for the given application."

The claimed dielectric coatings are particularly useful on flexible electrically conductive substrates such as stainless steel foils. The coatings are formed from silane-based starting materials as described in the specification and are cured to produce polymers having a network structure. See, page 4, paragraph [0010]. This structure is to be distinguished from the ladder structure mentioned in several of the cited prior art references. As is known in the art, silsesquioxanes can be polymerized, depending upon the starting monomers or oligomers, into either highly regular and crystalline ladder structures or random amorphous network structures.

The network polymer structures claimed by applicants provide several distinct advantages over prior art ladder polymers. Because the network structures are amorphous, the dielectric coatings exhibit excellent resistance to high temperatures such as those that would be encountered during a CIGS process to fabricate a photovoltaic cell. See, page 2, paragraph [0005]. The network structures, being amorphous, resist cracking from flexing better than

crystalline ladder structures and provide a better match to the coefficient of thermal expansion for the conductive substrate.

The cured dielectric coatings described in the present application possess excellent adhesion to flexible conductive substrates, even after thermal shock, as evidenced by the examples in the specification which used cryoscopic microtomy. See, Examples 1 and 3. The coatings also possess a high temperature stability as evidenced by the examples in the specification. See, Example 1 in which the coated substrate was used to build a photovoltaic cell based on CIGS deposition technology. As described in the specification at page 2, the CIGS process requires exposures to temperatures in the range of 550°C for at least an hour.

The Examiner has conceded that each of Nozue, Yagihashi, Aiba, and Linde all teach ladder polymer structures, not a network polymer as claimed. Ladder polymers are known to be inherently crystalline in structure and not as resistant to cracking, which can cause electrical shorts between adjacent conductive layers in a photovoltaic cell. Applicants also believe that a ladder polymer would not be able to withstand the fabrication conditions of CIGS-based photovoltaic devices.

In the most recent Office Action, the Examiner makes a number of statements to support his conclusion that the arguments that applicants presented in their previous response were "not persuasive." The Examiner asserts that the claimed invention "does not exclude ladder polymer[s]." Applicants do not understand this statement or its relevance. All of the claims explicitly state that the claimed dielectric coating has a "network structure." None of the prior art references cited teach or suggest such a coating; rather, all of the references teach ladder polymers which are inherently crystalline in nature.

The Examiner also stated that the claimed invention "does not require minimum temperature resistance and/or cracking resistance." Applicants have amended independent claims 1, 10, and 14 to recite that the coating exhibits resistance to temperatures in the range of 550°C with a resident time of at least one hour. Again, none of the cited prior art teaches or suggests such a coating having the requisite property of such temperature resistance.

Finally, the Examiner stated that the "broadly claimed invention is not limited to the coating composition of the Examples 1 and 3 of the instant application." Applicants agree, but note that claims need not be limited to specific working examples. Applicants do not understand

this statement or its relevance to whether the cited prior art teaches or suggests the claimed subject matter. As pointed out above, the cited prior art references do not.

As applicants pointed out in their previous response (the contents of which are incorporated herein by reference), all of Nozue, Yagihashi, Aiba, and Linde produce and use ladder polymers. Even if their teachings were to be combined in the manner proposed by the Examiner, the claimed dielectric coating having a network structure and exhibiting temperature resistance at temperatures used in CIGS processing would not result. No amount of optimization of a ***ladder polymer*** structure would arrive at the claimed ***network polymer*** structure. And, as shown by applicants, such a network structure provides distinct advantages over prior art ladder-type structures in terms of resistance to cracking and high temperature resistance. Applicants submit that the claims as amended patentably distinguish over the teachings of these references.

Also in the most recent Office Action, the Examiner rejected claims 1-22 under 35 USC §102 as anticipated by Paquet, U.S. 5822675, newly cited. Paquet describes a heating element that includes a metal substrate, an insulating layer of a silicone resin, an electrically resistive layer over the insulating layer, and conductible material on the resistive layer. The element is taught to be useful in consumer appliances as well as in industrial applications. Paquet states that the heating elements can withstand "temperatures of 250°C" for extended periods (col. 1, lines 60-63) and that the silicone resins are cured at temperatures "in a range of 150° to 400° C for 1 to 4 hours" (col. 3, lines 66-68).

However, Paquet is not directed to coatings which can withstand temperatures encountered in CIGS processing. Paquet is silent concerning the crystalline structure of the methylphenyl silicone polymers described therein, their resistance to temperatures of 550°C, and their resistance to cracking. Silence in a reference cannot form the basis for features that are absent from the disclosure in that reference. To anticipate, a reference must teach each and every limitation found in the rejected claim(s). Paquet does not. Paquet does not teach a coating having a network structure. Nor would such a structure be inherent because the numerous prior art references cited by the Examiner show that such silicone polymers can have ladder structures. Further, Paquet does not teach that the described polymers can withstand temperatures of 550°C for a resident time of at least one hour. Paquet's examples show temperature resistance of the heating element at 250°C (col. 5, line 51), 300°C less than that recited in the claims. Paquet fails

to teach each and every limitation in the claims and cannot anticipate those claims. Applicants submit that claims 1-22 as amended are patentable over Paquet.

For all of the above reasons, applicants submit that claims 1-22, as amended, are patentable over the cited and applied prior art and are in compliance with §112. Early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,
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